Having described the invention, the following is claimed:

1. A vehicle occupant safety system for helping to protect an occupant of a vehicle seat during a crash condition, the system comprising:

at least one sensor for sensing a vehicle crash condition and generating a signal indicative of the crash condition;

seat belt webbing for extending around the vehicle occupant; and

a pretensioner responsive to the signal generated by the sensor for acting on the seat belt webbing to pull an occupant of the vehicle seat who is forward in the vehicle seat backward toward a back portion of the vehicle seat,

the pretensioner comprising a seat belt retractor, the seat belt retractor including a spool on which the seat belt webbing is wound and an electric motor for rotating the spool in a belt retraction direction to pull the occupant backward toward the back portion of the vehicle seat.

2. The system of claim 1 further being defined by:

the electric motor being drivingly connected to the spool by a gear assembly; and

a portion of the spool forming part of the gear assembly

3. The system of claim 1 further being defined by:

the electric motor being drivingly connected to the spool by a non-backdrivable gear assembly;

the non-backdrivable gear assembly further being a locking mechanism that prevents rotation of the spool when the electric motor is not energized.

4. The system of claim 3 further being defined by:

the non-backdrivable gear assembly including a wobble gear and a portion of the spool;

the wobble gear having a plurality of teeth and the portion of the spool having a plurality of teeth, at least some of the teeth of the wobble gear being in meshing engagement with at least some of the teeth of the portion of the spool;

the plurality of teeth of the wobble gear including one more tooth than the plurality of teeth of the portion of the spool.

5. The system of claim 3 further including:

a controller electrically connected to the electric motor;

the controller also being electrically connected to the sensor and receiving the signal generated by the sensor;

upon receipt of the signal, the controller actuating the pretensioner.

6. The system of claim 5 further including:

a force detection device for detecting a force applied to the seat belt webbing;

the force detecting device being electrically connected to the controller and sending the controller a signal indicative of detected force.

7. The system of claim 6 further being defined by:

the force detection device being a micro-electro mechanical strain sensitive transducer.

8. The system of claim 6 further including:

a buckle sensing switch for detecting if a tongue assembly is latched into a buckle, the tongue assembly being adjustably connected with the seat belt webbing;

the buckle sensing switch being electrically connected to the controller and sending the controller a signal indicative of a latched condition of the buckle.

9. The system of claim 8 further being defined by:

the buckle sensing switch being a Hall effect device.

10. The system of claim 1 further being defined by:

the electric motor having a first mode of operation and a second mode of operation;

the first mode of operation occurring in an absence of the signal from the sensor, the first mode of operation allowing the electric motor to rotate the spool in the belt retraction direction and in a belt

withdrawal direction, opposite the belt retraction direction;

the second mode of operation occurring upon receipt of the signal from the sensor, the second mode of operation causing the electric motor to actuate the pretensioner to rotate the spool in the belt retraction direction to pull the occupant backward toward the back portion of the vehicle seat.

11. The system of claim 10 further being defined by:

in the first mode of operation, the electric motor receiving electric energy with an amperage in a predetermined range, and

in the second mode of operation, the electric motor receiving electric energy with an amperage greater than the predetermined range.

12. The system of claim 10 further being defined by:

in the first mode of operation, the electric motor rotating the spool to apply a first predetermined force to the seat belt webbing, and

in the second mode of operation, the electric motor rotating the spool to apply a force to the seat belt webbing that is greater than the first predetermined force.

13. The system of claim 11 further including:

a controller being electrically connected to the electric motor and controlling electric energy supplied to the electric motor.

Sub a1' 14. The system of claim 10 further including:

an inertial yaw stability, an extreme vehicle speed, or a proximity sensor for determining if a crash condition is impending and generating a signal indicative of the impending condition,

the electric motor further including a third mode of operation, the electric motor operating in the third mode of operation upon receiving the signal from the proximity sensor, the third mode of operation causing the electric motor to actuate the pretensioner to rotate the spool in the belt retraction direction to pull the occupant backward toward the back portion of the vehicle seat, the third mode of operation resulting

in a force on the seat belt webbing that is less than a force generated in the second mode of operation.

15. The system of claim 10 further including:

a gear assembly for transmitting power from the electric motor to the spool,

rotation of the electric motor causing wobbling of a part of the gear assembly,

wobbling of a part of the gear assembly causing rotation of the spool.